Improved Dovetailing Machine.

We illustrate herewith a dovetailing machine that for simplicity, strength, efficiency in operation, and accuracy of performance, will, we think, commend itself to all who may inspect its working.

The cutters are arranged in a gang, shown at A, and are driven by a belt, B, which passes alternately over and under pulleys on the cutter arbors. A vertical guide bar, C, descends from a sliding way upon which the cutter head rests, and slides up and down with it in suitable guides, when actuated by the hand lever, D, the rock lever, J, and the connecting rod, I.

From the side of the cutter head, A, extends a collar which slides on the guide lever, K. This guide lever is pivoted at the bottom, and being set at the proper angle by means of a graduated arc, and held in place by a set screw, it causes the cutter head to move laterally upon the sliding way which supports it, whenever it is raised or lowered by the lever, D, rock bar, J, and connecting rod, I, the resultant movement of the vertical and lateral motions being oblique to the vertical axis of the guide bar, C. When the pivoted guide bar, K, is set to the center of the graduated arc, the motion of the cutter head will be vertical.

The guide lever, K, is adjustable vertically with the graduated arc, by means of the screw, H, which raises or lowers it, so that when raised the motion of K to the right or left of the center of the graduated arc increases or diminishes the lateral motion of the cutter head, according as it is set higher or lower. The motion of the guide lever, K, is limited and regulated by means of set screws at the ends of the arch bar.

In dovetailing with this machine, the mortises are cut in the following manner: A number of pieces are placed on the bed of the machine and adjusted laterally by guide plates moved by the screws, G. The pieces are held down firmly by a vertical screw, F, and a foot plate which rests on the top of the upper piece of the boards to be worked. The cutter arbors being armed with tools, the sectional outline of which, on the axis of revolution, is that of the mortises: and the guide lever, K, being set to the center of the arc, the machine is set in motion, and the lever, D, being moved outward, causes the cutters to rise vertically, cutting through the ends of the boards, and by a single upward movement forming a large number of mortises.

In making the tenons, as well as the mortises, the ends of the board are placed against a guide plate attached to the cutter head, by which they are uniformly adjusted.

In tenoning, only single pieces are worked, as many tenons being cut simultaneously, as the number of cutters, if desired.

The piece is clamped in the same way as in mortising. The guide lever, K, is first moved to the extremity of the arc on one side, and the cutters being raised by the lever, D, move upward obliquely, and cut one side of the tenons to the previously adjusted bevel. The cutter head thus rises till it engages with a stop previously fixed to regulate the depth of the cuts. The lever, K, is then pressed over to the opposite side of the arc, which causes the cutters to traverse laterally and complete the cuts, except beveling the remaining side of the mortise, which is done by reversing the position of the lever, D, which causes the cutters to descend in the proper angle.

The cutter head is counterpoised as shown, and the distances of the cutters are uniformly and simultaneously adjusted by the hand screw, E.

The inner angles of the dovetailed mortises are rounded in blind dovetailing, and the tools for cutting the tenons are shaped to give the corresponding form to tenons.

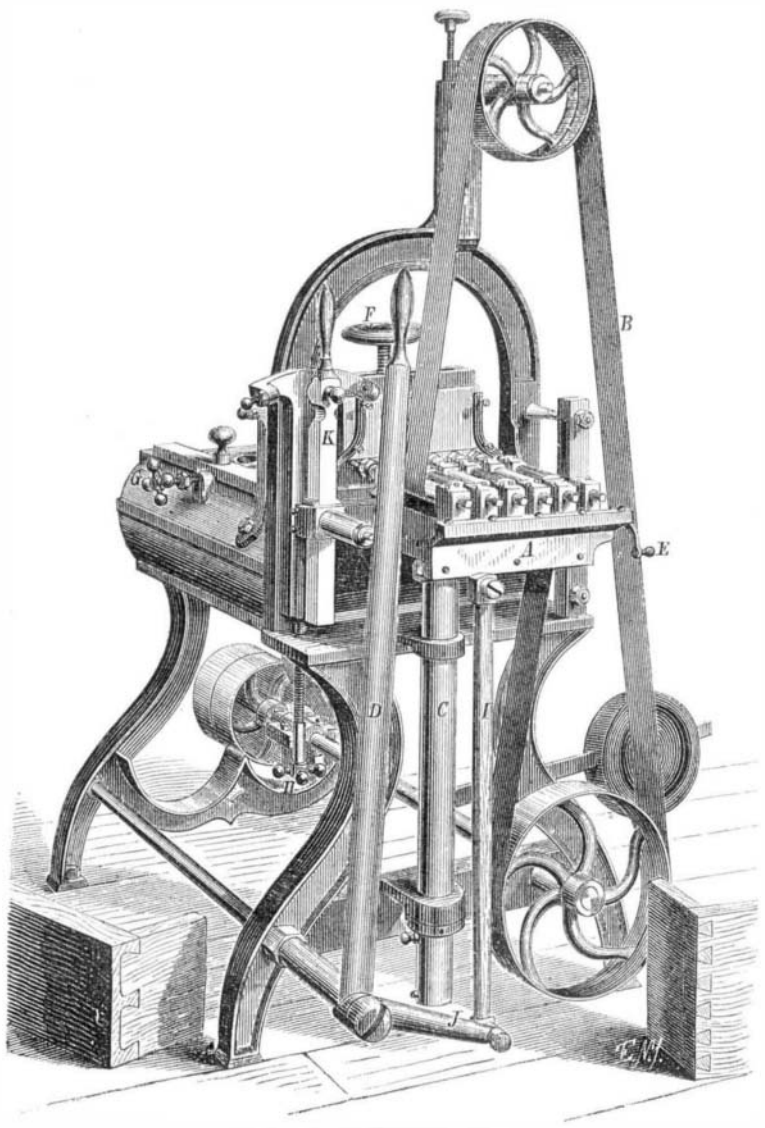
This machine makes a complete dovetail instead of a substitute for it, and does not weaken the work by cutting away wood unnecessarily for the sole purpose of making a fit. The cuttings are made by rotating cutters, which cut into the side of the grain of the wood, by which it is claimed they will retain a sharp edge to do four times the work that can be done by tools cutting endwise of the grain. This method of cutting also prevents splintering, in obstinate kinds of timber.

The lateral adjustment of the cutters to any desired width within the limits of the machine, without loss of time, attained by the use of the screw, E, is a great advantage.

The perfect adjustability of all the parts of the machine, is an important improvement, and it is claimed that it is more durable, and will perform more work in a given time, than other machines of its class.

We have seen the machine at work, but not under circumstances to test its speed of performance. Of the accuracy and beauty of its work we are, however, perfectly satisfied.

Patented June 7, 1870, and Jan. 3, 1871. For rights and other particulars, address H. H. Evarts, 93 Liberty st., N. Y., where a machine may be seen in operation, or at 66 Twenty-fourth st., Chicago, Ill., or Trevor & Co., manufacturers, Lockport, N. Y.



DOVETAILING MACHINE.

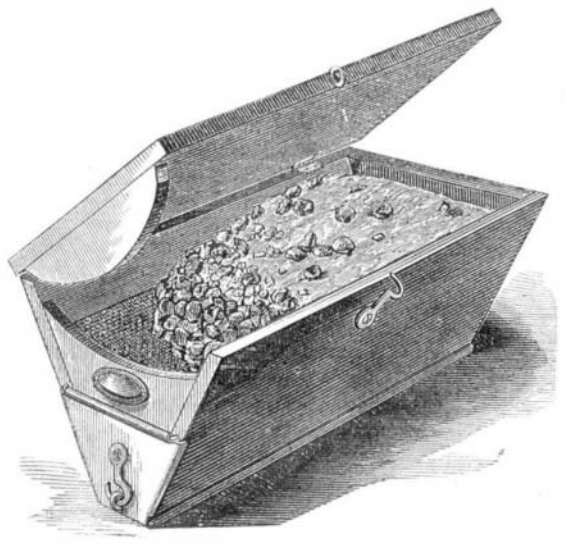
Trial of the New San Francisco Flying Machine.

The newly invented "flying machine," of which our readers have heard so much during the last year or two, was recently tried again, and, according to the San Francisco *Bulletin*, with considerable success. When everything was tightened and got in good running order, and the propeller arranged to cause elevation, it was just quarter of one o'clock. The fire for raising steam was kindled, and in one minute and a quarter steam was opened. At thirteen minutes to one the machine was cut loose, and the propellers started. She then rose most gracefully in the air, amid the cheers of the crowd who had gathered to witness the ascension. The machine was guided by cords attached to both ends of the balloon, and in the hands of persons on the ground. She ascended fifty feet, and sailed along about a block, when she was pulled down to have her boiler replenished. Again she rose, this time to a hight of about 200 feet. All the machinery connected with it worked to the perfect satisfaction of the inventor, who intends to place it on exhibition at some place, of which notice will be given. The name given her is "America."

IMPROVED COAL ASH SIFTER.

Our engraving illustrates the form of a new device for sifting coal ashes, by the use of which the inconveniences of dust are wholly obviated.

The sifter is a box of the form shown, with handles at the ends, and divided by a wire screen into an upper and a lower



compartment. A door leading from the lower compartment permits the removal of the ashes. Both this door and the top lid are made to fit so tightly as to be impermeable to dust.

The mixed coal and ashes being put into the upper compartment, a rocking motion of the box, or shaking it by means of the handles, separates the ashes from the coal and cinders, and this may be done on the stove or carpet without the escape of dust. The device seems well adapted to the purpose designed, can be furnished cheaply, and will prove a useful household utensil.

Patented through the Scientific American Patent Agency, Nov. 8, 1870. State, county, and manufacturer's rights for sale. Address W. S. Estey and I. S. Clough, patentees, 63 Fulton street, N. Y. B. T. Clough, of Waltham, Mass., may be addressed for rights in Massachusetts.

The Bituminous Coal Trade of 1870.

A Pittsburgh exchange says:—The total production of bituminous coal in this country, in 1870, amounted to fully 18,000,000 tuns. The bituminous trade bids fair to eclipse the anthracite in a few years. The latter amounted last year (as far as reported in Pennsylvania) to only 16,889,505 tuns. In Boston, in 1870, the anthracite trade fell off 36,400 while the bituminous increased 49,709 tuns. During the past year, the Baltimore and Ohio Railroad, with the Chesapeake and Ohio Canal, brought to market 1,717,075 tuns of Cumberland coal, a decrease of 165,000 tuns. The Huntingdon and Broad Top Railroad transported 313,822 tuns, a decrease of 46,850 tuns. The Tyrone and Clearfield branch of the Pennsylvania Central carried 345,000 tuns of the Phœnix Vein, while Alleghany Mountain mines shipped 90,000 tuns, mostly for local consumption. The Blossburg and the Towanda mines, which largely supply New York State and the Lake region, supplied, as near as can be ascertained, 500,000 tuns, Thus, the total consumption of bituminous coal, for iron, steam, and domestic uses, on the seaboard north of Cape Henry, aggregated 3,000,000 tuns. In addition, the gas coals of Western Pennsylvania and Virginia gave 1,500,000 tuns, of which one half was brought eastward by the Pennsylvania Central. The statistics of the western bituminous trade are only approximate.

It is an authenticated fact that Pittsburgh, beside consuming locally 600,000 tuns, shipped 2,000,000 tuns down the Ohio, at $2 each; yet so inadequate was the supply that it commanded $8 a tun at Memphis. Cleveland received, for its own consumption and for transportation on the lakes, nearly 1,000,000 tuns, by the Cleveland and Pittsburgh, and the Cleveland and Mahoning railroads. The great West and Northwest, taking the statistics of the "Panhandle" and the Pittsburgh, Fort Wayne and Chicago Railroads, consumed an additional 2,000,000 tuns. As near as can be ascertained, the Indiana, Illinois, Michigan, and Kentucky mines yielded nearly 4,000,000 tuns; and to these are to be added the productions of the vicinity of Richmond, Va., of Alabama and Tennessee. In view of this great and increasing production, the strikes of the anthracite miners will yearly become of less practical value. A silent revolution is at work in the coal trade. Baltimore seems to be losing the supremacy on the seaboard once held by the Cumberland coal, owing to the valuable tracts opened up in Clearfield county, Pa., during the last three years; but by the completion of the Cumberland Valley Railroad to the Potomac river, Baltimore retaliates by a sharp competition in the iron manufacturing regions of Central Pennsylvania. And while Philadelphia enjoys the benefits which Baltimore had by her Cumberland mines, Pittsburgh will lose command of the gas coal trade, by the completion of the Pittsburgh and Connellsville Railroad, opening up to Baltimore and the seaboard the rich gas coals of the Youghiogheny Valley. The present year promises to make some other important changes in the coal trade.

COD-LIVER OIL.

In every country on the earth there are to be found sufferers whose chief reliance against the ravages of damp and cold air is found in the oil from the codfish liver (*jecus aselli*). It is not, therefore, surprising that the single port of St. John, Newfoundland, exported last year nearly 350 tuns of this invaluable medicine. The declared value of this quantity is about $110,000. The oil is dissolved from the livers by gentle heat, in a tin vessel placed in boiling water, and filtered twice. The last filtration is made through heavy woolen cloth, and takes from the oil nearly all its odor and color, leaving in it all the iodine to which, in combination with its carbon, its alterative, fattening, and heat-creating properties are due. It is not only in consumption, but in scrofulous affections and diseases wasting the tissues, that its value is felt. The sickly infants of poor mothers, whose atrophy, from bad and insufficient food, commences even before their birth, can be nursed into health and plumpness by its aid. From its first introduction to the world in the year 1782, the use of it has been steadily on the increase; and the recent annual report of one of the largest of the London hospitals shows that 70 per cent of the patients of all classes are largely benefited by its use. It was first introduced into medicine by Dr. Percival.

Death of a Well-known Manufacturer.

Mr. James Albro, a well-known citizen of Elizabeth, who died on Friday, the 27th ult., had, in his special branch of business, a national reputation, as being the first American who had made original designs for oilcloth manufactured in this country. His experiments commenced as early as 1835 or 1836. At that time almost all the oilcloth used in the country was imported from England; the quality of the cloth manufactured here being inferior, and the patterns being copied from English cloths. Taking a national pride in producing, in price and quality, American goods that should give the imported cloths a less brisk market than they were enjoying, he devoted his attention exclusively to the improvement of the American oilcloths, and with such gratifying result that at the World's Fair in London, in 1862, the first prize was awarded to the firm of which he was the head.